		COMPUTER PROGRAMMING
ACADEMIC		
AA		**SPEAKING AND LISTENING**
AA	1	Utilizes effective verbal and non-verbal communication skills
AA	2	Participates in conversation, discussion, and group presentations
AA	3	Communicates and follows directions and procedures
AA	4	Communicates effectively with customers and co-workers
AB		**READING AND WRITING**
AB	1	Locates and interprets written information
AB	2	Reads and interprets workplace documents
AB	3	Identifies relevant details, facts, and specifications
AB	4	Records information accurately and completely
AB	5	Demonstrates competence in organizing, writing and editing using correct vocabulary, spelling, grammar, and punctuation
AB	6	Demonstrates the ability to write clearly and concisely using industry specific terminology
AC		**CRITICAL THINKING AND PROBLEM SOLVING**
AC	1	Utilizes critical-thinking skills to determine best options/outcomes (e.g., analyze reliable/unreliable sources of information, use previous experiences, implement crisis management, and develop contingency planning)
AC	2	Utilizes innovation and problem-solving skills to arrive at the best solution for current situation
AC	3	Implements effective decision-making skills
AD		**MATHEMATICS**
AD	1	Performs basic and higher level math operations (e.g., addition, subtraction, multiplication, division, decimals, fractions, units of conversion, averaging, percentage, proportion, and ratios)
AD	2	Solves problems using measurement skills (e.g., distance, weight, area, and volume)
AD	3	Makes reasonable estimates
AD	4	Uses tables, graphs, diagrams, and charts to obtain or convey information
AD	5	Uses deductive reasoning and problem-solving in mathematics
AE		**FINANCIAL LITERACY**
AE	1	Locates, evaluates, and applies personal financial information
AE	2	Identifies the components of a budget and how one is created
AE	3	Sets personal financial goals and develops a plan for achieving them
AE	4	Uses financial services effectively
AE	5	Demonstrates ability to meet financial obligations
AF		**INTERNET USE AND SECURITY**
AF	1	Recognizes the potential risks associated with Internet use
AF	2	Identifies and applies Internet security practices (e.g., password security, login, logout, log off, and lock computer)
AF	3	Practices safe, legal, and responsible use of technology in the workplace
AG		**INFORMATION TECHNOLOGY**
AG	1	Uses technology appropriately to enhance professional presentations
AG	2	Demonstrates effective and appropriate use of social media
AG	3	Identifies ways social media can be used as marketing, advertising, and data gathering tools
AH		**TELECOMMUNICATIONS**
AH	1	Selects and uses appropriate devices, services, and applications to complete workplace tasks
AH	2	Demonstrates appropriate etiquette when using e-communications (e.g., cell phone, e-mail, personal digital assistants, online meetings, and conference calls)
EMPLOYABILITY		
EA		**POSITIVE WORK ETHIC**
EA	1	Demonstrates enthusiasm and confidence about work and learning new tasks
EA	2	Demonstrates consistent and punctual attendance
EA	3	Demonstrates initiative in assuming tasks

EA	4	Exhibits dependability in the workplace
EA	5	Takes and provides direction in the workplace
EA	6	Accepts responsibility for personal decisions and actions
EB		**INTEGRITY**
EB	1	Abides by workplace policies and procedures
EB	2	Demonstrates honesty and reliability
EB	3	Demonstrates ethical characteristics and behaviors
EB	4	Maintains confidentiality and integrity of sensitive company information
EB	5	Demonstrates loyalty to the company
EC		**SELF-REPRESENTATION**
EC	1	Demonstrates appropriate dress and hygiene in the workplace
EC	2	Uses language and manners suitable for the workplace
EC	3	Demonstrates polite and respectful behavior toward others
EC	4	Demonstrates personal accountability in the workplace
EC	5	Demonstrates pride in work
ED		**TIME, TASK, AND RESOURCE MANAGEMENT**
ED	1	Plans and follows a work schedule
ED	2	Works with minimal supervision
ED	3	Works within budgetary constraints
ED	4	Demonstrates ability to stay on task to produce high quality deliverables on time
EE		**DIVERSITY AWARENESS**
EE	1	Recognizes diversity, discrimination, harassment, and equity
EE	2	Works well with all customers and co-workers
EE	3	Explains the benefits of diversity within the workplace
EE	4	Explains the importance of respect for feelings, values, and beliefs of others
EE	5	Identifies strategies to bridge cultural/generational differences and use differing perspectives to increase overall quality of work
EE	6	Illustrates techniques for eliminating gender bias and stereotyping in the workplace
EE	7	Identifies ways tasks can be structured to accommodate the diverse needs of workers
EE	8	Recognizes the challenges and advantages of a global workforce
EF		**TEAMWORK**
EF	1	Recognizes the characteristics of a team environment and conventional workplace
EF	2	Contributes to the success of the team
EF	3	Demonstrates effective team skills and evaluates their importance in the workplace (e.g., setting goals, listening, following directions, questioning, and dividing work)
EG		**CREATIVITY AND RESOURCEFULNESS**
EG	1	Contributes new ideas
EG	2	Stimulates ideas by posing questions
EG	3	Values varying ideas and opinions
EG	4	Locates and verifies information
EH		**CONFLICT RESOLUTION**
EH	1	Identifies conflict resolution skills to enhance productivity and improve workplace relationships
EH	2	Implements conflict resolution strategies and problem-solving skills
EH	3	Explains the use of documentation and its role as a component of conflict resolution
EI		**CUSTOMER/CLIENT SERVICE**
EI	1	Recognizes the importance of and demonstrates how to properly acknowledge customers/clients
EI	2	Identifies and addresses needs of customers/clients
EI	3	Provides helpful, courteous, and knowledgeable service
EI	4	Identifies appropriate channels of communication with customers/clients (e.g., phone call, face-to-face, e-mail, and website)
EI	5	Identifies techniques to seek and use customer/client feedback to improve company services
EI	6	Recognizes the relationship between customer/client satisfaction and company success

EJ		**ORGANIZATIONS, SYSTEMS, AND CLIMATES**
EJ	1	Defines profit and evaluates the cost of conducting business
EJ	2	Identifies "big picture" issues in conducting business
EJ	3	Identifies role in fulfilling the mission of the workplace
EJ	4	Identifies the rights of workers (e.g., adult and child labor laws and other equal employment opportunity laws)
EJ	5	Recognizes the chain of command, organizational flow chart system, and hierarchy of management within an organization
EK		**JOB ACQUISITION AND ADVANCEMENT**
EK	1	Recognizes the importance of maintaining a job and pursuing a career
EK	2	Defines jobs associated with a specific career path or profession
EK	3	Identifies and seeks various job opportunities (e.g., volunteerism, internships, co-op, and part-time and full-time employment)
EK	4	Prepares a resume, letter of application, and job application
EK	5	Prepares for a job interview (e.g., research company, highlight personal strengths, prepare questions, set-up a mock interview, and dress appropriately)
EK	6	Participates in a job interview
EK	7	Explains the proper procedure for leaving a job
EL		**LIFELONG LEARNING**
EL	1	Acquires current and emerging industry-related information
EL	2	Demonstrates commitment to learning as a life-long process and recognizes learning opportunities
EL	3	Seeks and capitalizes on self-improvement opportunities
EL	4	Discusses the importance of flexible career planning and career self-management
EL	5	Employs leadership skills to achieve workplace objectives (e.g., personal vision, adaptability, change, and shared vision)
EL	6	Recognizes the importance of job performance evaluation and coaching as it relates to career advancement
EL	7	Accepts and provides constructive criticism
EL	8	Describes the impact of the global economy on jobs and careers
EM		**JOB SPECIFIC TECHNOLOGIES**
EM	1	Identifies the value of new technologies and their impact on driving continuous change and the need for life-long learning
EM	2	Researches and identifies emerging technologies for specific careers
EM	3	Selects appropriate technological resources to accomplish work
EN		**HEALTH AND SAFETY**
EN	1	Assumes responsibility for safety of self and others
EN	2	Follows safety guidelines in the workplace
EN	3	Manages personal health and wellness
OCCUPATIONAL		
OA		**COMPUTER LITERACY**
OA	1	Demonstrate proficiency in a word processing package
OA	2	Demonstrate proficiency in a spreadsheet package
OA	3	Describe common applications of a database
OA	4	Demonstrate proficiency in a presentation package
OA	5	Send and receive electronic mail
OA	6	Print in landscape and portrait orientations
OA	7	Apply Internet etiquette and safety
OA	8	Explain the differences between a Web browser and a search engine
OA	9	Navigate a World Wide Web browser
OA	10	Identify Internet search engines and their advantages and disadvantages
OA	11	Demonstrate proficiency in the use of the Internet

OA	12	Identify what an operating system is, how it works, and be able to solve common problems
OA	13	Manipulate (e.g., create, copy, cut, paste, move, rename, delete) files and folders to manage and maintain data
OA	14	Discriminate between ethical and unethical uses of computers and information
OA	15	Demonstrate an understanding of copyrights and licensing
OA	16	Demonstrate an awareness of computer security and a basic understanding of ways to protect a computer (e.g., viruses, Trojans, Malware)
OA	17	Explain the impact of computers on society
OA	18	Identify types of computers, platforms, and devices explaining how they process information and how individual computers interact with other computing systems and devices
OA	19	Identify the function of computer hardware components
OA	20	Identify how to maintain computer equipment and solve common problems relating to computer hardware
OA	21	Identify how software and hardware work together to perform computing tasks and how software is developed and upgraded
OA	22	Identify different types of software, general concepts relating to software categories, and the tasks to which each type of software is most suited or not suited
OA	23	Demonstrate the safe and responsible use of resources, office equipment, and machines
OB		**INFORMATION TECHNOLOGY PROJECT MANAGEMENT**
OB	1	Determine client needs
OB	2	Determine the purpose and goals of the project
OB	3	Identify target audience
OB	4	Identify stakeholders and decision makers
OB	5	Define scope of work to meet client requirements
OB	6	Evaluate project requirements
OB	7	Estimate time requirements
OB	8	Create a project plan
OB	9	Estimate project pricing
OB	10	Demonstrate knowledge of project budgeting, scheduling, and control issues related to development and support
OB	11	Identify tools and resources for the job
OB	12	Identify critical milestones
OB	13	Report project status
OB	14	Identify software packages (e.g., MS Project, FreeWare, Shareware)
OC		**PROGRAMMING CONCEPTS**
OC	1	Trace the development of computers and the current industry trends in the programming field
OC	2	Describe ways that programming applications can be used in business and industry
OC	3	Describe the categories and future trends of programming languages
OC	4	Describe the functions of computer hardware, software, and computer theory including bits, bytes, binary logic, and storage
OC	5	Compare and contrast operating systems (e.g., full version, mobile)
OC	6	Describe the program development and integration cycle
OC	7	Identify the kind of development environments for different programming tasks
OD		**ALGORITHMIC/LOGIC PROCEDURES**
OD	1	Define a program specification
OD	2	Determine alternative solutions to problems
OD	3	Identify and create an algorithm
OE		**PROGRAMMING PROCEDURES**
OE	1	Demonstrate an understanding of steps for developing a program
OE	2	Design a program
OE	3	Code the program from an algorithm (e.g., pseudocode, flowchart)
OE	4	Run the program with sample data to test its validity

OE	5	Develop test data for a given program
OE	6	Identify the types and purposes of internal and external documentation
OE	7	Identify and explain different types of debugging errors
OE	8	Explain program with internal and external documentation
OF		**PROGRAMMING APPLICATIONS**
OF	1	Identify and use correct syntax - not language specific
OF	2	Create an application user interface
OF	3	Code a program that will produce formatted output consistent with the program requirements
OF	4	Code an application that uses arithmetic operations and built-in functions
OF	5	Identify and write a program that uses variables and constants
OF	6	Identify and write a program that use Boolean operators
OF	7	Identify and write a modular program that uses functions or methods
OF	8	Identify and write a program that uses conditional structures
OF	9	Identify and write a program that uses looping structures
OF	10	Identify and write a program that uses counters and/or accumulators
OF	11	Identify and write a program that uses arrays
OF	12	Identify and write a program that uses search and sort routines within arrays
OF	13	Implement recursion in program code
OF	14	Identify and write a program to open, write, and read from a data file
OF	15	Code an application program to display graphics
OF	16	Code a program that uses multimedia
OF	17	Code a program to animate objects
OF	18	Compare and contrast object-oriented programming vs. a procedural programming
OF	19	Identify and code a program using web services
OF	20	Define data types (e.g., integers, strings, arrays)
OF	21	Determine the usage of the three programming structures (i.e. sequence, repetition, selection/decision
OG		**DATABASE MANAGEMENT FUNCTIONS**
OG	1	Describe database structures
OG	2	Design a database with one or more tables for manipulation by program code
OG	3	Write code to create, revise, update, and delete (CRUD) the database into a program application
OG	4	Access a database located on a local area network that uses program code
OH		**ADVANCED PROGRAMMING PROCEDURES**
OH	1	Code a complex program from an algorithm (e.g., pseudocode, flowchart)
OH	2	Run the program with sample data to determine the validity of an application and error handling procedures
OH	3	Explain different types of errors
OH	4	Develop program documentation
OH	5	Identify advanced debugging concepts
OH	6	Develop types of internal and external documentation
OH	7	Identify attributes of maintainable code
OI		**WEB PAGE APPLICATIONS**
OI	1	Access a database that uses program code
OI	2	Develop scripts to support web based applications
OI	3	Develop client-server applications
OI	4	Configure communication protocols for wide area networks
OI	5	Use Internet and Web Page Design
OI	6	Use and document electronic resources and references in the development of a program application
OI	7	Evaluate the validity of sample code obtained from the Internet and other sources
OI	8	Develop a Web page to publish a programming application
OJ		**INDUSTRY CERTIFICATION**

OJ	1	Describe the process and requirements for obtaining industry certification related to programming
OJ	2	Demonstrate the ability to successfully complete selected practice examinations and practice questions similar to those on certification exams
OJ	3	Identify testing skills/strategies for taking a certification examination
OK		**CAREER PATHWAYS IN PROGRAMMING**
OK	1	Identify careers in the programming field
OK	2	Search the Internet and other sources for job opportunities
OK	3	Assemble a professional portfolio that contains representative samples of student's work
OK	4	Deliver an oral presentation relating to the professional portfolio
OK	5	Identify potential employment barriers for nontraditional groups and ways to overcome the barriers